

1.8 Write Linear Equations by Translating Written Descriptions

- There are many English expressions that translate into a mathematical expression.

Addition	Subtraction	Multiplication	Division
plus more than increased by exceeds sum	minus short reduced by deducted from	times magnified product	divided by the ratio of factor of reduced by fraction of

- All variables that are used when writing equations must be clearly defined.

Example 1

State the algebraic expression for each of the following. In each case let the variable be x .

- a. four more people than last year $x + 4$
- b. twice as many dogs as cats $2x$
- c. ten less boys than girls $x - 10$
- d. half as much flour $x \div 2$

~~$10 - x$~~ No!

OR
 $\frac{x}{2}$ OR $0.5x$

Example 2

Write an algebraic expression for each of the following. Create the equation first then be sure to define the variables x and y .

- a. Her original golf score was 121 but has reduced her score by 3 strokes each time she golfs.

$$y = 121 - 3x$$

- Let x represent # of times she golfed
- Let y represent total score

- b. Terry gets paid 40 per shift plus \$2 per sale.

$$y = 40 + 2x$$

- Let x represent # of sales
- Let y represent total pay

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Example 3

When renting a car I paid \$19.99 for the car and was charged \$0.10/km.

- Write an equation to represent this situation.
- Determine the cost of the car if I drove to and from Toronto for a total of 960km.
- How many kilometres would I have driven if the total bill was \$72.50?

- $y = 19.99 + 0.10x$
 - Let x represent # of km driven
 - Let y represent total cost of car.

- $$y = 19.99 + 0.10(960)$$

$$= 115.99$$

- Therefore, the total cost for driving 960km would be \$ 160.

c.

$$72.50 = 19.99 + 0.10x$$

$$72.50 - 19.99 = 0.10x$$

$$\frac{52.51}{0.10} = \frac{0.10x}{0.10}$$

$$525.10 = x$$

- Therefore, I would have driven 525.10 km if the total bill was \$72.50.